Environmental Systems Analysis and Management

Research Areas

- Ecosystem engineering
- Resource management
- System dynamics analysis
- Fate and effects in biosystems
- Pharmacokinetic modeling

Recent Successes

Through systems analysis of natural ecosystem processes, modeling efforts have demonstrated how the unique conditions within wetlands (plant species and soil conditions) can be used to remediate chlorinated solvent contamination. These conditions have been reproduced physically in the laboratory and in pilot scale columns, and AFIT researchers are completing the construction of a field scale artificial wetland to cleanup an actual groundwater plume of tetrachloroethylene (PCE). Technology will save millions of dollars across the Air Force and billions nationally

Facilities

AFIT's new state-of-the-art laboratory allows experimentation with various environmental media to explore new technology designs arising from computer analysis. These findings confirm and refine technology concepts, and optimal design specifications are explored using the latest systems analysis software supported by powerful computer facilities.

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Research Interests:

- System dynamics modeling in analyzing long-term management strategies
- Abiotic and biochemical contaminant fate and transport
- Physiologically-based pharmacokinetic modeling
- Ecological engineering design to optimize environmental program management

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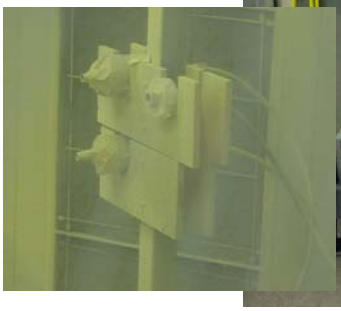

Research Areas

- Aerosol characterization
- Metal Bioavailability
- Air Management Strategies

Recent Successes

Chromate-containing primer paints are the dominant choice in Air Force aircraft and Navy ship protection because of their excellent corrosion inhibition characteristics. However, chromate is also a heavily regulated cancer-causing agent. Aerosol sampling and characterization research is conducted at AFIT with the Navy Health Research Center and the AF
Coating Technology Integration Office to determine the optimal safety measures for the use of these irreplaceable corrosion protection products. This research will aid in developing costs effective filtration systems and worker protection systems while maintaining compliance with current and future OSHA and EPA regulations.

Facilities

AFIT owns a large variety of aerosol sampling equipment and a complete analytical chemistry lab including atomic absorption spectroscopy, high pressure liquid chromatography, gas chromatography, microwave digester, particle counters, refrigerated centrifuge housed in a new multi-million dollar facility.

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Research Interests:

- Risk assessment
- Pollution prevention modeling
- Metals toxicity